

## IN THE CLAIMS

Claims 1-4 (cancelled).

5. (Previously Presented) A method for screening a neuroactive drug compound for neural plasticity comprising the steps of:

- a) culturing at least one group of adult *Drosophila melanogaster* fruit flies using a media comprising a neuroactive drug and at least a second group of adult *Drosophila melanogaster* fruit flies using a media without a neuroactive drug;
- b) measuring one or more horizontal and vertical locomotor activities of the flies of step a);
- c) examining locomotor activity of the two groups of flies in terms of height climbed, distance walked or climbing speed wherein an alteration in one of the locomotor activities of the flies cultured using the media with a neuroactive drug compared to the flies cultured using a media without a neuroactive compound is characteristic of effect of exposure to the neuroactive drug;
- d) maintaining the fruit flies of step a) that were cultured using the media comprising the neuroactive using a media comprising the neuroactive drug;
- e) maintaining the fruit flies of step a) fed with the media comprising the neuroactive drug with a media without a neuroactive drug; and
- f) examining locomotor activity of the flies of step e) in terms of height climbed, distance walked or climbing speed wherein an alteration in one of the locomotor activities compared to the measurement of step c) is indicative of neural plasticity induced by the neuroactive drug.

Claims 6-9 (cancelled).

10. (New) A method for screening of a neuroactive drug compound for neural plasticity comprising the steps of:

- a) culturing adult *Drosophila melanogaster* fruit flies in a media comprising one or

more drugs that act on the central nervous system selected from the group consisting of convulsants, mood-stabilizers, and anticonvulsants for seven days;

b) measuring horizontal and vertical locomotor activities of the flies of step (a) wherein said activities are selected from the group consisting of distance walked, height climbed, and climbing speed;

c) examining vertical locomotor activity of the flies wherein an alteration in height climbed in flies of step (b) indicates effect of neuroactive drugs;

d) maintaining the fruit flies of step (a) that were cultured using the media comprising the neuroactive drugs for 10 days in the drug containing media and then shifting the flies to drug free media for 30 days;

e) measuring various horizontal and vertical locomotor activities in flies of step (d), and

f) examining locomotor activity of the flies of step (e) wherein an alteration in climbing speed is indicative of withdrawal from neuroactive drugs.